CR-209211

Report 11303
28 October 1998

GENCORP
AEROJET

Integrated Advanced Microwave Sounding Unit-A (AMSU-A)

Engineering Test Report

METSAT A1 Signal Processor (P/N 1331670-2, S/N F05)

Contract No. NAS 5-32314
CDRL 207

Submitted to:

National Aeronautics and Space Administration
Goddard Space Flight Center
Greenbelt, Maryland 20771

Submitted by:

Aerojet
1100 West Hollyvale Street
Azusa, California 91702

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1.0 Introduction

This report presents a description of the tests performed, and the test data, for the A1 METSAT Signal Processor Assembly PN: 1331679-2, S/N F05. The assembly was tested in accordance with AE-26754, "METSAT Signal Processor Scan Drive Test and Integration Procedure".

The tests were conducted at room temperature in the AMSU-A test area of building 57. The tests fall into six categories: 1) Continuity, 2) Power Distribution, 3) Digital Processor, 4) Analog Processor, 5) Scan Drive, and 6) Supply Current.

2.0 Objective

The objective is to demonstrate functionality of the signal processor prior to instrument integration.

3.0 Test Data

All test data is presented on the enclosed copies of the test data sheets (TDSs) numbered TDS 1 through TDS 10 (Pages A-2 through A-14). Redlines to the data sheets were necessary and were accomplished in accordance with program directive No. 91. Each change was approved by Quality and the test engineer. Changes were made for the following reasons: 1) Test parameter limits were changed due to design changes in the instrument circuitry, 2) Addition of CCA serial number recording locations, and 3) Correction of a typing error. Also included with the test data sheets is the Manufacturing Assembly Instructions list of the CCA card cage slot assignment record listing each CCA part number and serial number.

4.0 TESTS

4.1 Continuity

A complete continuity test of the backplane wiring is performed at the facility where the wirewrapping of the backplane is done. The continuity tests performed here involve 1) the I/O interface card slots, J301 and J326, 2) the Aerojet added Pre-amp/detector signal cable and connector, 3) the Aerojet added Pre-amp/detector power cable and connector, and 4) chassis return connections. The tests are manual resistance measurements tests. Test data is presented on TDS 1.

4.2 Power Distribution

In these tests supply voltages are input to the signal processor from the Test Relay Unit (TRU) as in normal testing. No CCAs are installed in the signal processor for the tests. The test verifies that the four supply voltages are present on the proper pins of all backplane connectors. The test setup block diagram is shown in Figure 1, and test data is presented on TDS 2.

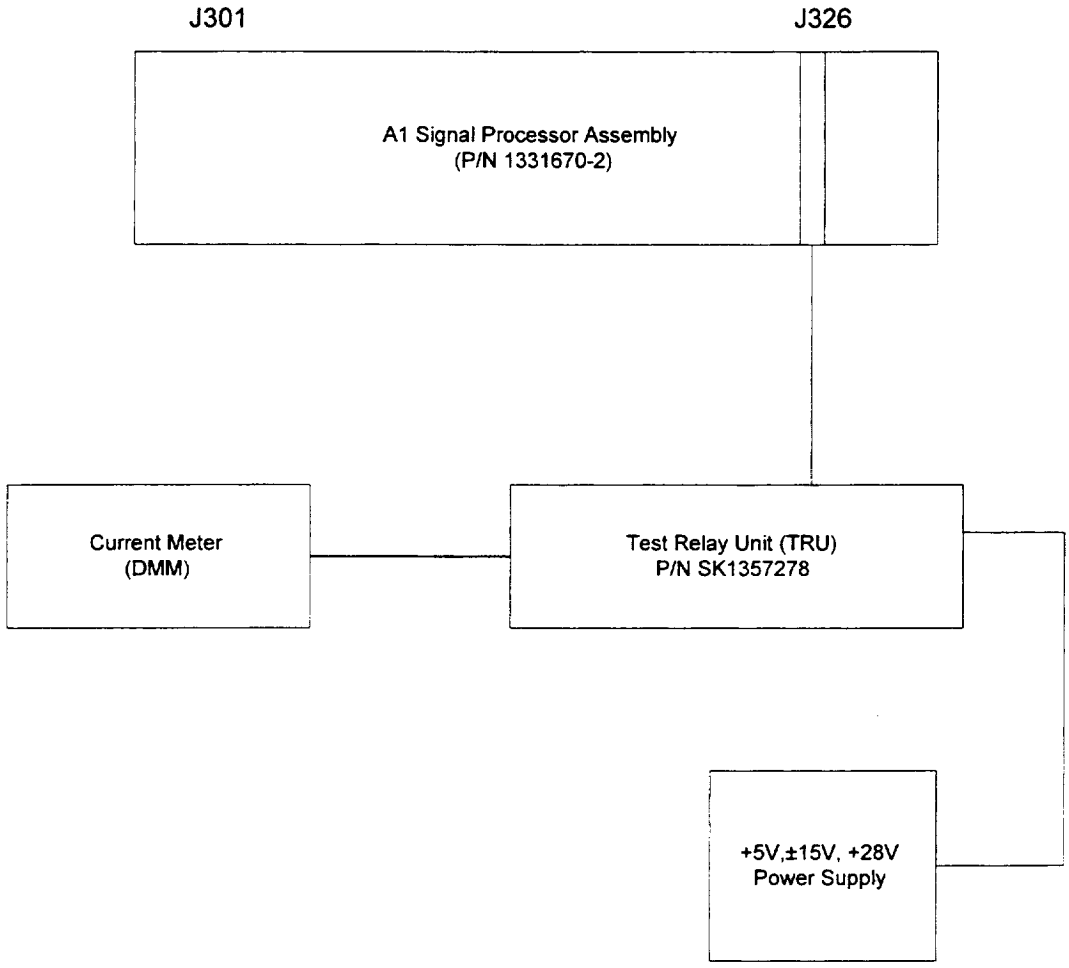


Figure 1. A1 Signal Processor Test Setup

4.3 Digital Processor

Beginning with this test, CCAs are installed into the card cage as required to perform the test, and then remain installed. At the conclusion of all tests, a complete set of CCAs has been installed. The complete test setup block diagram which is required for performing any of the tests is shown in Figure 2.

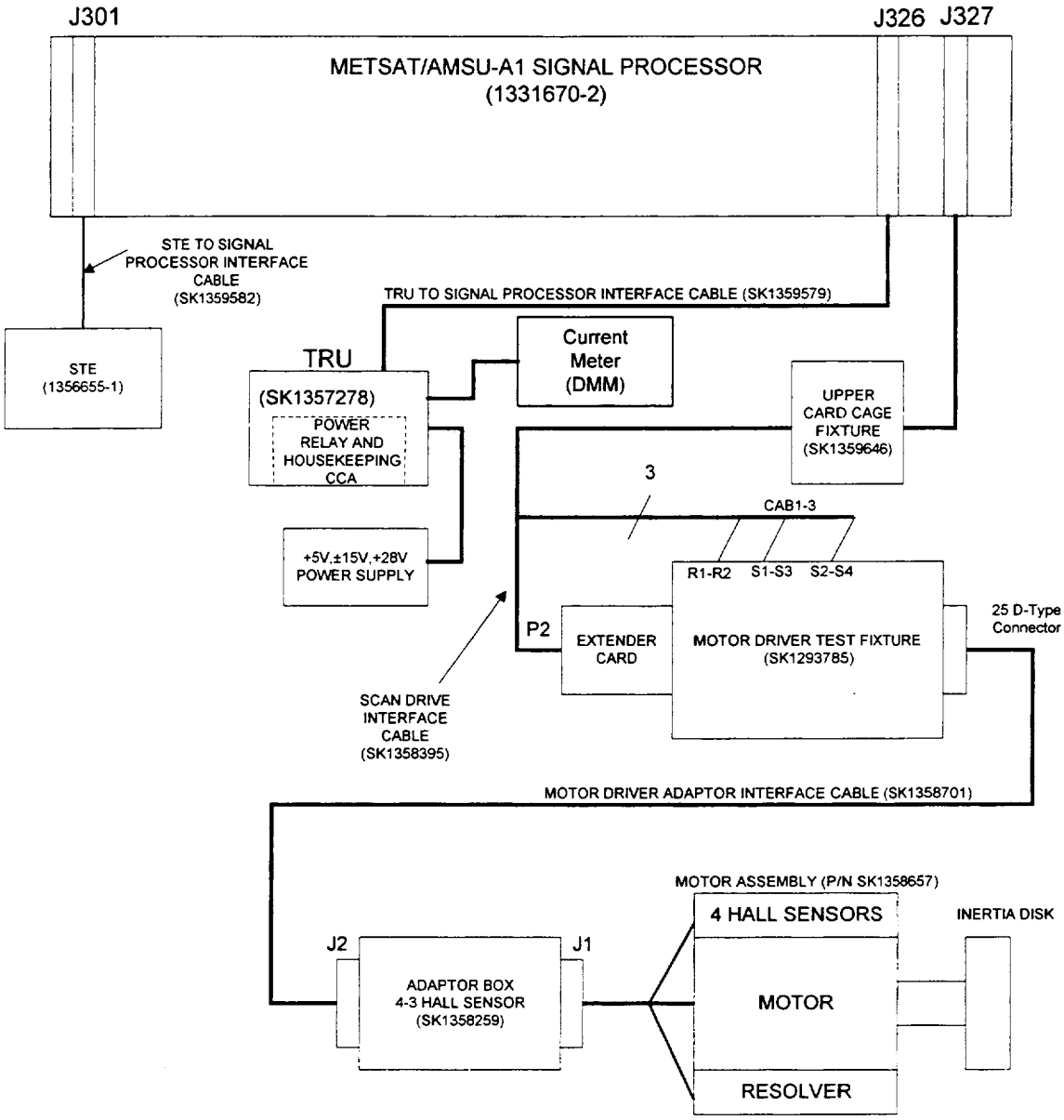


Figure 2 Scan Drive Test Set-Up

4.3.1 Memory

In this test, the digital test set is used in place of the CPU CCA to read and verify data of the test PROMs on the "GOLD" Memory CCA. Test data is presented on TDS 3.

4.3.2 CPU

The CPU test requires that the CPU Auxiliary test CCA be installed in place of the Memory CCA. In this test, the RAM and various instructions performed by the CPU are tested. In addition, the waveform of the clock signal to the DC-DC converter is measured at the CLOCK jack on the TRU. Test data is presented on TDS 3.

4.3.3 Scan Control Interface

In this test, input and output ports 0 through 3 are tested. In addition, the disable feature of the input ports is checked out. Test data is presented on TDS 3.

4.3.4 Timing and Control

In this test, the proper time intervals of I/H, DUMP, INTCMPL,TSCMPL, STOP, and ANTENNA STROBE are verified. In addition to the above tests, the test set also checks the input ports 16 and 17, output port #13 (4 MSBs), output port 14, input port #15 (DAC BSY signal), and output port #13 (4 LSBs). Test data is presented on TDS 3.

4.3.5 Spacecraft Interface

In this test, the STE is turned on and initialized. The STE is tested with a series of self-tests to verify the readiness of the STE to test flight hardware. After successfully passing the self-tests, the STE is used to simulate the spacecraft command signals and retrieve limited test data for the remaining signal processor tests. STE test data is presented on TDS 4.

4.3.6 Relay Control

This test verifies the operation of the module power command and the survival heater command. The presence of the +10 volt Interface power is verified. The PLO lock alarm signals, Scan 1 and 2 relay drive and position indicators, and PLO relay drive and relay position indicators are also verified. Test data is presented on TDS 4.

4.4 Analog Processor

4.4.1 Independence of Measurements

This test is performed using the Analog CCA Test Fixture, the Integrate and Dump Filter and the Analog Mux and A/D Converter CCAs. The test gives a measurement of the sample-to-sample crosstalk within a channel, which is dependent on the completeness of the dump of the integration capacitor. Test data is presented on TDS 5.

4.4.2 Integrate/dump filter, radiometric data multiplexing, and digitization tests

In this test, a 2 volt dc signal is input to each integrate and dump filter, and the channel output code from the A/D converter is measured. The integrator output waveform is also displayed on an oscilloscope for verification of timing. Test data is presented on TDS 6.

4.4.3 Temperature monitoring circuits

In this test a resistor of value approximating the room temperature resistance of the PRTs is connected at the input of each PRT readout circuit, and the output code from the A/D converter is measured. The reference voltage used in the PRT readout circuits is also measured. Test data is presented on TDS 7.

4.4.4 Analog telemetry

In this test each of the analog telemetry signals is measured at the ANALOG HSKP jack on the TRU. Test data is presented on TDS 8.

4.5 Scan Drive

This test includes all CCAs involved in the scan drive function. The circuitry is programmed to provide one complete revolution of the drive motor as it steps through each of the thirty scene positions and the two calibration positions. The circuitry is programmed to park at the Warm Cal, Cold Cal, and the Nadir positions during the test sequence. The GSE test modes are also verified. To verify proper performance, the inertia disk on the motor shaft is visually observed through the one revolution and the various calibration positions. Test data is presented on TDS 9.

4.6 Supply Current

In this test, the total current drawn by the signal processor from each of the four supply voltages is measured with the signal processor fully populated with CCA's. Test data is presented on TDS 10.

5.0 TEST ANOMALIES

One test anomaly occurred at the beginning of the scan drive tests. Power was applied after setting up for the scan drive tests and the +5 volt power source current limited. Troubleshooting and visual inspection revealed that P1 of the scan drive interface cable and the Motor Drive CCA, which respectively plug into J408 andJ401 of the upper card cage fixture, were inadvertently plugged in the wrong way (connectors reversed end-for-end). The setup anomaly was corrected and the test was completed. A stress analysis was performed on the Motor Drive CCA and a Test Anomaly Report (attached) was opened (TAR 002409) (Failure reported as FAR 155). Some overstressed components were identified and replaced. The scan drive tests were repeated and successfully passed.

6.0 TEST RESULTS

The METSAT/AMSU A1 SIGNAL PROCESSOR TEST was successfully completed and all test data is within specified limits.

F05

GENCORP AEROJET	MANUFACTURING ASSEMBLY INSTRUCTIONS (M.A.I.)			PAGE	OF
	PART DESCRIPTION: SIGNAL PROCESSING ASSY.		PART NUMBER: 1331670-2	6	7
PLANNED BY: J. DIPASQUALE	DATE: 5/08/97	REVISION: 01	NEXT ASSEMBLY: 1331720-2		OPER: 0090

MFG 155

SEP 23 1998

5. Record Serial Numbers of each CCA below.

d) Record S/N of each CCA in the area noted below, also record S/N on the Data Sheet.
Note: CCA'S will be installed at Operation 0120 per AE-26002/3 Test Procedure.

e) Record Part No. and S/N of CCA required, for location J317 Connector.

LOCATION	ITEM #	CCA PART NO.	SERIAL NO.	DESCRIPTION	COMMENTS
J301					
J302					
J303	2	1338421-1	S/N F10	TEMP. SENSOR A	
J304	3	1331682-1	S/N F30	TEMP. SENSOR BD. "B"	
J305	3	1331682-1	S/N F34	TEMP. SENSOR BD. "B"	
J306	4	1331688-1	S/N F24	Temp.Sensor,ANLG MUX	
J307	5	1356418-1	S/N F05	MUX AND ANLG/DGTL	
J308	6	1338424-1	S/N F22	INTEG. & DUMP FILTER	
J309	6	1338424-1	S/N F25	INTEG. & DUMP FILTER	
J310	6	1338424-1	S/N F34	INTEG. & DUMP FILTER	
J311	6	1338424-1	S/N F38	INTEG. & DUMP FILTER	
J312	7	1331147-1	S/N F13	SPACECRAFT I/F NO.2	
J313	8	1331144-1	S/N F22	SPACECRAFT I/F NO.1	
J314	9	1351150-1	S/N F23	PARALLEL TO SER CNVTR	
J315	10	1331135-1	S/N F08	TIMING AN CONTROL	
J316	11	1356413-2	S/N F10	CPU	
J317	12	*	S/N F01	MEMORY ASSY.	**
J318	13	1331129-1	S/N F26	SCAN CONTROL INTFC	
J319	40	1356911-1	S/N F04	RELAY DRVR & CUR MON	
J320	14	1331697-1	S/N F22	Interface/Converter	***
J321	15	1334972-1	S/N F34	RSLVR DATA ISOL	
J322	16	1337739-1	S/N F23	R-D CONVERTER/OSC	***
J323	14	1331697-1	S/N F26	Interface/Converter	***
J324	15	1334972-1	S/N F35	RSLVR DATA ISOL	
J325	16	1337739-1	S/N F24	R-D CONVERTER/OSC	***
J326					
J327					

* = See table #1 for selection of CCA required at this location.

** = Memory CCA installed at next assembly.

*** = Test and select resistors added at system level test.
Not Conformal Coated when installed at next assembly.

670dasht1

Figure #4

TEST DATA SHEET 1

A1 Continuity Tests (4.2.1)

From	To	Signal Name	Pass/Fail
J301-1	P511-3	CH 3 - IN	P
J301-10	P511-13	CH 8 - IN	P
J301-13	P511-15	CH 9 - IN	P
J301-15	P511-17	CH 10 - IN	P
J301-16	P511-19	CH 11 - IN	P
J301-19	P511-21	CH 12 - IN	P
J301-21	P511-23	CH 13 - IN	P
J301-22	P511-25	CH 14 - IN	P
J301-25	P511-1	CH 15 - IN	P
J301-3	P511-5	CH 4 - IN	P
J301-4	P511-7	CH 5 - IN	P
J301-60	E1	CHASSIS GND	P
J301-7	P511-9	CH 6 - IN	P
J301-9	P511-11	CH 7 - IN	P
J301-90	E2	CHASSIS GND	P
J304-43	P512-5	+15V(2)	P
J304-45	P512-24	+15V(2)	P
J304-46	P512-9	15VRTN(2/3)	P
J304-48	P512-29	15VRTN(2/3)	P
J304-49	P512-14	-15V(3)	P
J304-51	P512-15	-15V(3)	P
J305-68	P512-12	PRT35_HI (PRE AMP)	P
J305-72	P512-11	PRT35_LO (PRE AMP)	P
J326-76	E3	CHASSIS GND	P

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer [signature] 9/28/98 (Signature) (Date)

Quality Control [signature] SEP 29 '98 (Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10/10/98 (Signature) (Date)

TEST DATA SHEET 2

A1 Power Distribution (Paragraphs 4.2.2 & 4.2.3)

Power Supply Voltages:

+5.7 ± 0.1V: 5.74V +15.7 ± 0.1V: 15.692V

-15.7 ± 0.1V: -15.677V +28.7 ± 0.1V: 28.74V

Test Set-up Verified: YES ✓ NO ____

Para. 4.2.3 Step No.	Connector No.	+5 ±0.5 V	P/F	+15 ±0.3V	P/F	-15 ±0.3V	P/F	+28 ±0.56V	P/F	+9 ±1V*	P/F
7*	J301									9.41	P
1	J303			14.98	P	-14.98	P				
2	J304			14.98	P	-14.98	P				
3	J305			14.98	P	-14.98	P				
4	J306			14.98	P	-14.98	P				
5	J307	5.00	P	14.98	P	-14.98	P				
5	J308			14.98	P	-14.98	P				
5	J309			14.98	P	-14.98	P				
5	J310			14.98	P	-14.98	P				
5	J311			14.98	P	-14.98	P				
5	J312	5.00	P							9.41	P
5	J313	5.00	P							9.41	P
5	J314	5.00	P								
5	J315	5.00	P								
5	J316	5.00	P								
5	J317	5.00	P								
5	J318	5.00	P								
5	J319	5.00	P	14.98	P	-14.98	P	28.00	P		
5	J320	5.00	P	14.98	P	-14.98	P				
5	J321	5.01	P								
5	J322	5.01	P	14.98	P	-14.98	P				
5	J323	5.00	P	14.98	P	-14.98	P				
5	J324	5.01	P								
5	J325	5.01	P	14.98	P	-14.98	P				
6	J327	5.02	P	14.98	P	-14.98	P	27.98	P		

*measured at paragraph 4.2.5.2. test

Assembly No. 133670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lind 9/28/98 (Signature) (Date)

Quality Control ____ SEP 29 '98 (Signature) (Date)

Customer Representative (Flight hardware only) J Sanford 10-1-98 (Signature) (Date)

TEST DATA SHEET 3 (Sheet 1 of 2)
A1 Digital Processor (Paragraph 4.2.4)

CPU CCA Serial No. (J316) F10
Scan Control Interface CCA Serial No. (J318) F26
Timing and Control CCA Serial No. (J315) F08

4.2.4.1 Memory tests:

4.2.4.1/10 Circle Pass or Fail to indicate the result of the tests : (Pass) Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.2 CPU tests:

4.2.4.2/10		Measurements	Limits	Pass/Fail
	Vp-p	3.70 Vpp	3.30 - 4.94 V	P
	T	801 nS	761 - 841 ns	P

4.2.4.2/19 Circle Pass or Fail to indicate the result of the CPU tests P Pass ___ Fail

4.2.4.3 Scan Control Interface Tests:

4.2.4.3/16 The input ports 0 and 1 tests (Pass) Fail

4.2.4.3/23 Inhibit input port 0 and 1 tests (Pass) Fail

4.2.4.3/35 The input ports 2 and 3 tests (Pass) Fail

4.2.4.3/42 Inhibit input port 2 and 3 tests (Pass) Fail

4.2.4.3/55 The output ports 0 and 1 tests (Pass) Fail

TEST DATA SHEET 3 (Sheet 2 of 2)
AI Digital Processor (Paragraph 4.2.4)

4.2.4.3 Scan Control Interface Tests (Cont):

4.2.4.3/63 The output ports 2 and 3 tests — (Pass) Fail

If "Fail", record the error code and error description.

Error Code: N/A

Error Description: N/A

4.2.4.4 Timing and Control Tests:

4.2.4.4/13	The Integrate and Hold pulse and the Dump pulse at the card rack slot J308.	(Pass) Fail
4.2.4.4/23	The Integrate and Hold pulse and the Dump pulse at the card rack slot J309.	(Pass) Fail
4.2.4.4/33	The Integrate and Hold pulse and the Dump pulse at the card rack slot J310.	(Pass) Fail
4.2.4.4/43	The Integrate and Hold pulse and the Dump pulse at the card rack slot J311.	(Pass) Fail
4.2.4.4/54	The Integrate and Hold pulse and the Dump pulse at the card rack slot J301.	(Pass) Fail
4.2.4.4/64	The Antenna Strobe pulse test at J320.	(Pass) Fail
4.2.4.4/68	The Antenna Strobe pulse test at J323.	(Pass) Fail
4.2.4.4/78	The test of the interface to the Temp. Sensor Analog Mux card rack slot J306.	(Pass) Fail
4.2.4.4/89	The test of the interface to the Analog Mux and Converter card rack slot J307.	(Pass) Fail

If "Fail", record error code and error description:

Error Code: N/A

Error Description: N/A

Assembly No. 1331670-2 Shop Order No. S-43653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 (Signature) (Date)

Quality Control [signature] SEP 29 '98 (Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10-10-98 (Signature) (Date)

TEST DATA SHEET 4

A1 Relay Driver Tests (Paragraph 4.2.5.2)

Spacecraft Interface #2 CCA (J312) Ser. No. F13
Spacecraft Interface #1 CCA (J313) Ser. No. F22
Parallel to Serial Converter CCA (J314) Ser. No. F23
Relay Driver And Current Monitor CCA (J319) Ser. No. F04

Test Set-up Verified: Yes ✓ No ____ STE Self Test: Pass ✓ Fail ____

Step No.	Test Description	Pass/Fail
23	Module power connects	P
26	Survival heater power turns on	P
27	Survival heater power turns off	P
28	Module power disconnects	P
30	Scanner 1 power turns on	P
31	Scanner 2 power turns on	P
32	Scanner 1 power turns off	P
32	Scanner 2 power turns off	P
34	PLLO toggle	P
35	Module power disconnect	P

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 Quality Control _____ SEP 29 '98
(Signature) (Date) (Signature) (Date)

Customer Representative (Flight hardware only) _____ 10-10-98
(Signature) (Date)

TEST DATA SHEET 5

A1 Independence Of Measurements (Paragraph 4.2.6.1)

Analog Mux and A/D Converter CCA Serial. No. F05

Test Set-up verified: YES ✓ NO ____

Supply	Measured Value (V)	Limits (V)
+5	4.804	+5 ± 0.25
+15	15.85	+15 ± 1.0
-15	-15.423	-15 ± 1.0

Integrate and Dump/Filter CCA Serial No.	Channel No.	Average for SIGNAL switch in HI position	Average for SIGNAL switch in LO position	Measurement Dependence ≤0.01%	Pass/ Fail
F22	0	14197.7	14196.1	0.00244	P
	1	14221.5	14219.3	0.00336	P
	2	14203.9	14201.7	0.00336	P
	3	14197.1	14195.3	0.00275	P
F25	0	14165.3	14163.4	0.0029	P
	1	14152.3	14150.9	0.00366	P
	2	14145.4	14143.7	0.00259	P
	3	14145.3	14144	0.00198	P
F34	0	14178	14176	0.00305	P
	1	14177.2	14175.4	0.00275	P
	2	14188.9	14185.8	0.00473	P
	3	14162.9	14160.8	0.0032	P
F38	0	14146.8	14145.9	0.0029	P
	1	14155	14153.6	0.00214	P
	2	14148.7	14146.7	0.00305	P
	3	14154.8	14152.6	0.00336	P

Assembly No. 133670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund (Signature) (Date)

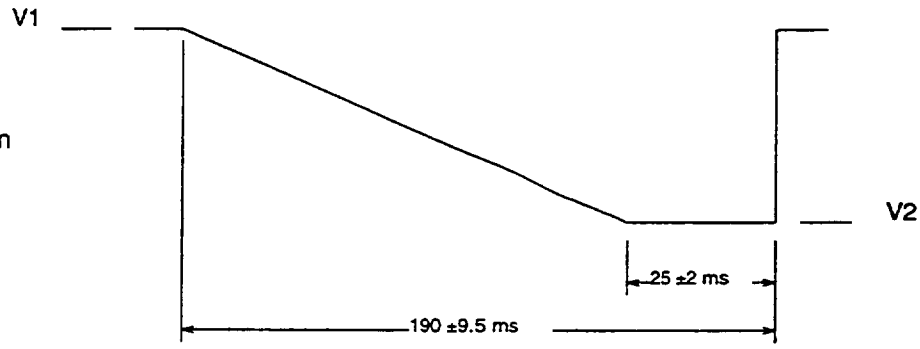
Quality Control (Signature) SEP 29 '98 (Date)

Customer Representative (Flight hardware only) (Signature) 10-10-98 (Date)

TEST DATA SHEET 6 (Sheet 1 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

Analog Mux and A/D Converter CCA: Ser. No. F05
Integrate and Dump/Filter CCA:
Rack Slot J308: Ser. No. F22
Rack Slot J309: Ser. No. F25
Rack Slot J310: Ser. No. F34
Rack Slot J311: Ser. No. F38

Output Waveform



Channel	Data	Data Limits	Data Pass/Fail	Integrator Waveform Pass/Fail
3	29273	27282 to 31076	P	P
4	29014	27282 to 31076	P	P
5	29153	27282 to 31076	P	P
6	29119	27282 to 31076	P	P
7	29353	27282 to 31076	P	P
8	29069	27282 to 31076	P	P
9	29224	27282 to 31076	P	P
10	29028	27282 to 31076	P	P
11	29247	27282 to 31076	P	P
12	29137	27282 to 31076	P	P
13	29157	27282 to 31076	P	P
14	29119	27282 to 31076	P	P
15	29154	27282 to 31076	P	P

TEST DATA SHEET 6 (Sheet 2 Of 2)
A1 Integrator Signal Multiplexing, And Digitization (Paragraph 4.2.6.2)

Signal Name	Output	Output Return	Signal Levels	Pass/Fail
I/H	J301-42	J301-41	Pulses (TTL)	P
Dump	J301-45	J301-41	Pulses (TTL)	P
+5 Vdc GSE Interlock A	J301-61	J301-70	+5 V	P
+5 Vdc GSE Interlock B	J301-62	J301-70	+5 V	P

Assembly No. 1331670-2 Shop Order No. S4365-3

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 Quality Control _____ SEP 29 '98
(Signature) (Date) (Signature) (Date)

Customer Representative (Flight hardware only) _____ 10-10-98
(Signature) (Date)

TEST DATA SHEET 7 (Sheet 1 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Temperature Sensor A CCA(J303) Serial No. F10
Temperature Sensor B CCA (J304) Serial No. F30
Temperature Sensor B CCA (J305) Serial No. F34
Temperature Sensor Analog Mux CCA (J306) Serial No. F24

Dig. A Temp No.	Description	Data	Data Limits	Pass/Fail
1	Scan Motor A1-1	31084	28259 to 32513	P
2	Scan Motor A1-2	31443	28259 to 32513	P
3	Feedhorn A1-1	31151	28259 to 32513	P
4	Feedhorn A1-2	31317	28259 to 32513	P
5	RF MUX A1-1	31341	28259 to 32513	P
6	RF MUX A1-2	31094	28259 to 32513	P
7	LO CH 3	31328	28259 to 32513	P
8	LO CH 4	31619	28259 to 32513	P
9	LO CH 5	31150	28259 to 32513	P
10	LO CH 6	31104	28259 to 32513	P
11	LO CH 7	31456	28259 to 32513	P
12	LO CH 8	30615	28259 to 32513	P
13	LO CH 15	31346	28259 to 32513	P
14	PLO #2	31323	28259 to 32513	P
15	PLO #1	31682	28259 to 32513	P
16	N/A	N/A	N/A	N/A
17	Mixer IF CH 3	31605	28259 to 32513	P
18	Mixer IF CH 4	31604	28259 to 32513	P
19	Mixer IF CH 5	31349	28259 to 32513	P
20	Mixer IF CH 6	31494	28259 to 32513	P
21	Mixer IF CH 7	31384	28259 to 32513	P
22	Mixer IF CH 8	31384	28259 to 32513	P
23	Mixer IF CH 9/14	31414	28259 to 32513	P
24	Mixer IF CH 15	31264	28259 to 32513	P
25	IF Amp CH 11/14	31786	28259 to 32513	P
26	IF Amp CH 9	31114	28259 to 32513	P
27	IF Amp CH 10	31472	28259 to 32513	P
28	IF Amp CH 11	31214	28259 to 32513	P
29	DC/DC Conv	30997	28259 to 32513	P
30	IF Amp CH 13	31270	28259 to 32513	P
31	IF Amp CH 14	31346	28259 to 32513	P
32	IF Amp CH 12	31156	28259 to 32513	P
33	RF Shelf A1-1	30918	28259 to 32513	P
34	RF Shelf A1-2	31326	28259 to 32513	P
35	Detector/Preamp	31352	28259 to 32513	P

TEST DATA SHEET 7 (Sheet 2 of 2)
A1 Temperature Monitoring Circuits (Paragraph 4.2.6.3)

Dig. A Temp No.	Description	Data	Data Limits	Pass/Fail
36	A1-1 Warm Load 1	22683	20339 to 23401	P
37	A1-1 Warm Load 2	22520	20339 to 23401	P
38	A1-1 Warm Load 3	22636	20339 to 23401	P
39	A1-1 Warm Load 4	22597	20339 to 23401	P
40	A1-1 Warm Load C	22697	20339 to 23401	P
41	A1-2 Warm Load 1	22533	20339 to 23401	P
42	A1-2 Warm Load 2	22687	20339 to 23401	P
43	A1-2 Warm Load 3	22785	20339 to 23401	P
44	A1-2 Warm Load 4	22534	20339 to 23401	P
45	A1-2 Warm Load C	22579	20339 to 23401	P
46	Thermal Reference	25327	23340 to 26320	P

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer [signature] 9/28/98
(Signature) (Date)

Quality Control [signature] SEP 29 '98
(Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10-10-98
(Signature) (Date)

TEST DATA SHEET 8

A1 Analog Telemetry (Paragraph 4.2.6.4)

ANALOG HSKP Switch Position	DVM Reading (V)	Limits (V)	Pass/Fail
1	2.99	2.85 to 3.15	P
2	3.46	3.30 to 3.66	P
3	2.98	2.87 to 3.17	P
4	3.02	2.85 to 3.15	P
5	3.45	3.30 to 3.66	P
6	2.99	2.87 to 3.17	P
7	3.45	3.30 to 3.66	P
8	2.99	2.87 to 3.17	P
9	2.98	2.85 to 3.15	P
10	3.57	3.42 to 3.78	P
11	3.26	3.13 to 3.45	P
12	2.96	2.84 to 3.14	P
13	2.96	2.84 to 3.14	P
14	2.96	2.84 to 3.14	P
15	2.97	2.84 to 3.14	P
16	2.97	2.84 to 3.14	P
17	2.97	2.84 to 3.14	P
18	3.45	3.30 to 3.66	P
19	0.05	~~4.30 to 4.66~~ -0.1 to 0.1	P
19	~~0.05~~ -4.03	~~0.4 to 0.48~~ -3.7 to -4.3	P
20	0.06	~~4.30 to 4.66~~ -0.1 to 0.1	P
20	-4.02	~~0.4 to 0.48~~ -3.7 to -4.3	P
21	-0.005	-0.05 to 0.05	P
21	2.932	2.8 to 3.4	P
22	0.001	-0.05 to 0.05	P
22	2.943	2.8 to 3.4	P

D Lund 9/28/98 QC 229

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 (Signature) (Date)

Quality Control [signature] (Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10-10-98 (Signature) (Date)

TEST DATA SHEET 9

A1 Scan Drive/ Signal Processor Tests (Paragraph 4.3.1 And 4.3.2)

A1-1 Drive Subsystem CCAs:

Interface Converter CCA (J320) Ser. No. F21
Resolver Data Isolator CCA (J321) Ser. No. F35
R/D Converter/Oscillator CCA (J322) Ser. No. F24
Motor Driver 3-hall sensor CCA (J401) Ser. No. F06
Test Set-up Verified: Yes ✓ No ____

D Lund 9/23/98
QC 229

Para/Step No.	Mode	Pass/Fail
4.3.1.2.1/11	Motor in warm cal position	P
4.3.1.2.2/3	Motor in nadir position	P
4.3.1.2.3/2	Motor in cold cal position 1	P
4.3.1.2.3/3	Motor in cold cal position 2	P
4.3.1.2.3/4	Motor in cold cal position 3	P
4.3.1.2.3/5	Motor in cold cal position 4	P
4.3.1.2.4/5	Motor in full scan mode	P
4.3.1.2.5/9	GSE mode 2	P
4.3.1.2.6/4	GSE mode 4	P
4.3.1.2.7/4	GSE mode 5	P
4.3.1.2.8/4	GSE mode 1	P
4.3.1.2.9/4	GSE mode 3	P
4.3.1.2.9/7	GSE mode 7	P
4.3.1.2.10/2	Scan power off	P

A1-2 Drive Subsystem CCAs:

Interface Converter CCA (J323) Ser. No. F26
Resolver Data Isolator CCA (J324) Ser. No. F34
R/D Converter/Oscillator CCA (J325) Ser. No. F23
Motor Drive 3-Hall sensor CCA (J404) Ser. No. F10
Test Set-up Verified: Yes ✓ No ____

D Lund 9/24/98
QC 229

Para. No./Step No.		
4.3.2.2	A1-2 scan drive operates in full scan mode.	Pass ✓ Fail ____

Assembly No. 1331670-2 Shop Order No. 54365-3

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 (Signature) (Date) Quality Control [signature] OCT 8 '98 (Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10-10-98 (Signature) (Date)

TEST DATA SHEET 10

A1 Supply Currents (Paragraph 4.4)

Voltages	Measured Current	Limits (in mA)	Pass/Fail
+28.7V	7.57 mA	6 to 12	P
+5.7V	680 mA	~~700~~ to ~~1642~~ 550 to 900	P
+15.7V	196 mA	152 to 364	P
-15.7V	192 mA	162 to 381	P

Assembly No. 133170-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 9/28/98 (Signature) (Date)

Quality Control ____ OCT 8 '98 (Signature) (Date)

Customer Representative (Flight hardware only) ____ 10-10-98 (Signature) (Date)

Retest

TEST DATA SHEET 9

A1 Scan Drive/ Signal Processor Tests (Paragraph 4.3.1 And 4.3.2)

A1-1 Drive Subsystem CCAs:

Interface Converter CCA (J320) Ser. No. F22
Resolver Data Isolator CCA (J321) Ser. No. F35
R/D Converter/Oscillator CCA (J322) Ser. No. F24
Motor Drive 3-Hall Sensor CCA (J401) Ser. No. F06
Test Set-up Verified: Yes ✓ No ____

D Lund 9/28/98 QC 223

Para/Step No.	Mode	Pass/Fail
4.3.1.2.1/11	Motor in warm cal position	P
4.3.1.2.2/3	Motor in nadir position	P
4.3.1.2.3/2	Motor in cold cal position 1	P
4.3.1.2.3/3	Motor in cold cal position 2	P
4.3.1.2.3/4	Motor in cold cal position 3	P
4.3.1.2.3/5	Motor in cold cal position 4	P
4.3.1.2.4/5	Motor in full scan mode	P
4.3.1.2.5/9	GSE mode 2	P
4.3.1.2.6/4	GSE mode 4	P
4.3.1.2.7/4	GSE mode 5	P
4.3.1.2.8/4	GSE mode 1	P
4.3.1.2.9/4	GSE mode 3	P
4.3.1.2.9/7	GSE mode 7	P
4.3.1.2.10/2	Scan power off	P

A1-2 Drive Subsystem CCAs:

Interface Converter CCA (J323) Ser. No. F26
Resolver Data Isolator CCA (J324) Ser. No. F34
R/D Converter/Oscillator CCA (J325) Ser. No. F23
Motor Drive 3-Hall Sensor CCA (J404) Ser. No. F10
Test Set-up Verified: Yes ✓ No ____

D Lund 9/28/98 QC 223

Para. No./Step No.		
4.3.2.2	A1-2 scan drive operates in full scan mode.	Pass ✓ Fail ____

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lund 10/08/98 (Signature) (Date) Quality Control [signature] OCT 8 '98 (Signature) (Date)

Customer Representative (Flight hardware only) [signature] 10-10-98 (Signature) (Date)

Retest

AE-26754A
11 June 98

TEST DATA SHEET 10
A1 Supply Currents (Paragraph 4.4)

Voltages	Measured Current	Limits (in mA)	Pass/Fail
+28.7V	758 mA	6 to 12	P
+5.7V	650 mA	~~700 to 1642~~ 550 to 900	P
+15.7V	196 mA	152 to 364	P
-15.7V	-191 mA	162 to 381	P

Assembly No. 1331670-2 Shop Order No. 543653

Serial No. F05 Pass ✓ Fail ____

Test Engineer D Lind 10/08/98 (Signature) (Date)

Quality Control [signature] OCT 8 '98 (Signature) (Date)

Customer Representative (Flight hardware only) J. Campanella 10-10-98 (Signature) (Date)

NASA
National Aeronautics and Space Administration

Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
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4. Title and Subtitle	5. Report Date
Integrated Advanced Microwave Sounding Unit-A (AMSU-A), Engineering Test Report	28 October 1998
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7. Author(s): D. Lund	8. Performing Organization Report No.: 11303
	10. Work Unit No.: ---
9. Performing Organization Name and Address: Aerojet, 1100 W. Hollyvale, Azusa, CA 91702	11. Contract or Grant No.: NAS 5-32314
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15. Supplementary Notes: ---

16. ABSTRACT (*Maximum 200 words*)

This is the Engineering Test Report, METSAT A1 Signal Processor (P/N 1331670-2, S/N F05), for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

17. Key Words (Suggested by Author(s))	18. Distribution Statement
EOS Microwave System	Unclassified --- Unlimited

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Unclassified	Unclassified		---

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D. Lund

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11. SUPPLEMENTARY NOTES

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13. ABSTRACT (*Maximum 200 words*)

This is the Engineering Test Report, METSAT A2 Signal Processor (P/N 1331670-2, S/N F05), for the Integrated Advanced Microwave Sounding Unit-A (AMSU-A).

14. SUBJECT TERMS

EOS
Microwave System

15. NUMBER OF PAGES

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Systems Engineer (R. Platt)	8311	11/2/98
Design Assurance (E. Lorenz)	8331	11/2/98
Quality Assurance (R. Taylor)	7831	11/2/98
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